**Worksheet 4.2A- Linear Regression Intro (AIRFARES) NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

NEED: prgm CORR, group AIRFARES (lists DIST and AIRF)

The lists DIST and AIRF contain the following data:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Destination** | **Distance** | **Airfare** | **Destination** | **Distance** | **Airfare** |
| Atlanta | 576 | 178 | Miami | 946 | 198 |
| Boston | 370 | 138 | New Orleans | 998 | 188 |
| Chicago | 612 | 94 | New York | 189 | 98 |
| Dallas | 1216 | 278 | Orlando | 787 | 179 |
| Detroit | 409 | 158 | Pittsburgh | 210 | 138 |
| Denver | 1502 | 258 | St. Louis | 737 | 98 |

1. Create a scatterplot of distance (x-var) vs. airfare (y-var) and draw it below (be accurate in your drawing- label the axes). Describe the form, direction and strength. Do there appear to be any outliers?
2. Find the equation of the LSR line using the calculator. Write it below, with the names of the variables (instead of just X and Y). Also, find correlation (*r*)*.*
3. What airfare does the LSR line predict for a destination that is 370 miles away? Show your work below.
4. What airfare does the LSR line predict for a destination that is 1502 miles away? Show your work below.
5. Calculate the residual (error) for each of these last two estimates (*residual = error = actual Y value – predicted Y value*). You will find the actual Y values in the chart of the data above.
6. What airfare would the regression line predict for a flight to San Francisco, which is 2842 miles from Baltimore? Would you take this prediction as seriously as the ones above? Why or why not?
7. The actual airfare for San Francisco at that time was $198. Give the error for your prediction to SF.
8. Use the equation of the regression line to predict the airfare if the distance is 900 miles. Record the prediction below, and then continue these predictions to fill in the rest of the table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **miles** | 900 | 901 | 902 | 903 | 904 |
| **airfare** |  |  |  |  |  |

1. Do you notice a pattern in these predictions? By how many dollars is each prediction higher than the preceding one? Does this number look familiar (form your earlier calculations)? Explain.
2. This shows how we can interpret the slope of the LSR line. Interpret the slope in context of the problem.
3. By how much does the regression line predict airfare to rise for each additional 100 miles that a destination is farther away?
4. What is the coefficient of determination (r2)? Interpret this number